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concl'd carrying out the assay in the presence of an organic compound that reduces luminescence that is not dependent on the presence of an analyte by at least about 10 fold, and that reduces luminescence that is dependent on the presence of an analyte by less than about 7 fold.

a³ 3. (Amended) A method for increasing the sensitivity of a bio-luminescent assay comprising carrying out the assay in the presence of an organic compound that reduces autoluminescence by at least about 10 fold, and that reduces luminescence that is dependent on the presence of an analyte by less than about 7 fold.

a⁴ 15. (Amended) The method of any one of claims 1-3 wherein the assay is [caried] carried out in a solvent comprising at least about 25% water by weight.

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Please add the following new claims.

35. (NEW) A method for increasing the sensitivity of a bio-luminescent assay comprising carrying out the assay in the presence of an organic compound that reduces the luminescence that does not result from a bio-luminescent reaction by at least about 10 fold, and that reduces luminescence that does result from a bio-luminescent reaction by less than about 7 fold.

a⁵ 36. (NEW) The method of claim 1 wherein the luminescence that is dependent on the presence of an analyte is maintained or increases.

37. (NEW) The method of claim 2 wherein the luminescence generated by luminogenic molecules bound to an enzyme is maintained or increases.

38. (NEW) The method of claim 3 wherein the luminescence that is dependent on the presence of an analyte is maintained or increases.

39.(NEW) The method of claim 35 wherein the luminescence that results from a bio-

luminescent reaction is maintained or increases.

40.(NEW) The method of claim 1 wherein the luminescence that is not dependent on the presence of an analyte is chemi-luminescence that does not result from a bio-luminescent reaction.

41.(NEW) The method of claim 1 wherein the luminescence that is dependent on the presence of an analyte comprises luminescence generated within a living cell.

42.(NEW) The method of claim 2 wherein the luminescence generated by luminogenic molecules bound to an enzyme comprises luminescence generated within a living cell.

43.(NEW) The method of claim 3 wherein the luminescence that is dependent on the presence of an analyte comprises luminescence generated within a living cell.

44.(NEW) The method of claim 35 wherein the luminescence that does not result from a bio-luminescent reaction comprises luminescence generated within a living cell.

45.(NEW) The method of claim 1 wherein luminescence that is not dependent on the presence of an analyte comprises luminescence generated by a chemical reaction of coelenterazine or a functional analog thereof.

46.(NEW) The method of claim 2 wherein the luminescence generated by luminogenic molecules not bound to an enzyme comprises luminescence generated by a chemical reaction of coelenterazine or a functional analog thereof.

47.(NEW) The method of claim 3 wherein the auto luminescence comprises luminescence generated by a chemical reaction of coelenterazine or a functional analog thereof.

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48.(NEW) The method of claim 35 wherein the luminescence that does not result from a bio-luminescent reaction comprises luminescence generated by a chemical reaction of coelenterazine or a functional analog thereof.

49.(NEW) An assay kit comprising packaging material containing 1) a luminogenic substrate of an enzyme, or a luminogenic enzyme; and 2) an organic compound for reducing luminescence that does not result from a bio-luminescent reaction by at least about 10 fold, and that reduces luminescence does result from a bio-luminescent reaction by less than about 7 fold.

50. (NEW) The assay kit of claim 22 wherein the luminescence that is dependent on the presence of an analyte is maintained or increases.

51. (NEW) The assay kit of claim 23 wherein the luminescence generated by luminogenic molecules bound to an enzyme is maintained or increases.

52. (NEW) The assay kit of claim 24 wherein the luminescence that is dependent on the presence of an analyte is maintained or increases.

53.(NEW) The assay kit of claim 49 wherein the luminescence that results from a bio-luminescent reaction is maintained or increases.

54.(NEW) The assay kit of claim 22 wherein the luminescence that is dependent on the presence of an analyte comprises luminescence generated within a living cell.

55.(NEW) The assay kit of claim 23 wherein the luminescence generated by luminogenic molecules bound to an enzyme comprises luminescence generated within a living cell.

56.(NEW) The assay kit of claim 24 wherein the luminescence that is dependent on the presence of an analyte comprises luminescence generated within a living cell.

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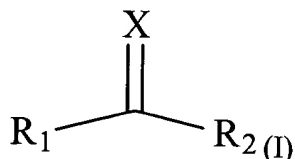
57.(NEW) The assay kit of claim 49 wherein the luminescence that does not result from a bio-luminescent reaction comprises luminescence generated within a living cell.

58. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound comprises a sulfur atom or a selenium atom.

59. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound contains a carbon-sulfur double bond (C=S).

60. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound contains a carbon-selenium double bond (C=Se).

61. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of formula (I):



wherein X is S or Se; R₁ and R₂ are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, heteroaryl, or NR_aR_b; or R₁ and R₂ together with the carbon to which they are attached form a 5, 6, 7, or 8 membered saturated or unsaturated ring comprising carbon and optionally comprising 1, 2, or 3 heteroatoms selected from oxy (-O-), thio (-S-), or nitrogen (-NR_c-), wherein said ring is optionally substituted with 1, 2, or 3 halo, hydroxy, oxo, thioxo, carboxy, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, or heteroaryl; and R_a, R_b and R_c are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, (C₂-C₂₀)alkynyl, aryl,

heteroaryl; wherein any (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₂-C₂₀)alkenyl (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, or (C₂-C₂₀)alkynyl of R₁, R₂, R_a, R_b, and R_c is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more halo, hydroxy, mercapto, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkanoyloxy, sulfo or (C₁-C₂₀)alkoxycarbonyl; or a salt thereof.

62. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of formula R₃SH wherein R₃ is (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, or heteroaryl; wherein any (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, or (C₂-C₂₀)alkynyl of R₃ is optionally substituted with one or more halo, hydroxy, mercapto oxo, thioxo, carboxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, heteroaryl, or NR_dR_e; wherein R_d and R_e are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more (1, 2, 3, or 4) halo, mercapto, hydroxy, oxo, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkanoyloxy, sulfo or (C₁-C₂₀)alkoxycarbonyl; or a salt thereof.

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63. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of formula R₄NCS wherein: R₄ is (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, or heteroaryl; wherein any (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, or (C₂-C₂₀)alkynyl of R₄ is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, heteroaryl, or NR_fR_g; wherein R_f and R_g are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more (1, 2, 3, or 4) halo, mercapto, hydroxy, oxo, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkanoyloxy, sulfo or (C₁-C₂₀)alkoxycarbonyl; or a salt thereof.

64. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of formula R_5-X-R_6 wherein:

X is -S- or -Se-;

R_5 is (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl; and R_6 is hydrogen, (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl;

or R_5 and R_6 together with X form a heteroaryl;

wherein any (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, or (C_2-C_{20}) alkynyl of R_5 or R_6 is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, heteroaryl, or NR_kR_m ;

wherein R_k and R_m are each independently hydrogen, (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, or heteroaryl; and

wherein any aryl or heteroaryl is optionally substituted with one or more halo, mercapto, hydroxy, oxo, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkanoyloxy, sulfo or (C_1-C_{20}) alkoxycarbonyl; or a salt thereof.

65. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of any one of formulae 1-11 of Figure 4.

66. (NEW) The method of any one of claims 1, 2, 3, and 35 wherein the organic compound is a compound of formulae 1, 2, 4, or 6 as shown in Figure 4.

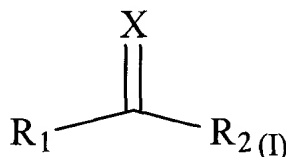
67. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound comprises a sulfur atom or a selenium atom.

68. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound contains a carbon-sulfur double bond ($C=S$).

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69. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound contains a carbon-selenium double bond (C=Se).

70. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound is a compound of formula (I):



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wherein X is S or Se; R₁ and R₂ are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, heteroaryl, or NR_aR_b; or R₁ and R₂ together with the carbon to which they are attached form a 5, 6, 7, or 8 membered saturated or unsaturated ring comprising carbon and optionally comprising 1, 2, or 3 heteroatoms selected from oxy (-O-), thio (-S-), or nitrogen (-NR_c-), wherein said ring is optionally substituted with 1, 2, or 3 halo, hydroxy, oxo, thioxo, carboxy, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, (C₂-C₂₀)alkenyl, (C₂-C₂₀)alkynyl, aryl, or heteroaryl; and R_a, R_b and R_c are each independently hydrogen, (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₂-C₂₀)alkenyl, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, (C₂-C₂₀)alkynyl, aryl, heteroaryl; wherein any (C₁-C₂₀)alkyl, (C₃-C₈)cycloalkyl, (C₁-C₂₀)alkoxy, (C₂-C₂₀)alkenyl (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, or (C₂-C₂₀)alkynyl of R₁, R₂, R_a, R_b, and R_c is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more halo, hydroxy, mercapto, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C₁-C₂₀)alkanoyl, (C₁-C₂₀)alkanoyloxy, sulfo or (C₁-C₂₀)alkoxycarbonyl; or a salt thereof.

71. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound is a

compound of formula R_3SH wherein R_3 is (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl; wherein any (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, or (C_2-C_{20}) alkynyl of R_3 is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, heteroaryl, or NR_dR_e ; wherein R_d and R_e are each independently hydrogen, (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more (1, 2, 3, or 4) halo, mercapto, hydroxy, oxo, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkanoyloxy, sulfo or (C_1-C_{20}) alkoxycarbonyl; or a salt thereof.

72. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound is a compound of formula R_4NCS wherein: R_4 is (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl; wherein any (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, or (C_2-C_{20}) alkynyl of R_4 is optionally substituted with one or more halo, hydroxy, mercapto, oxo, thioxo, carboxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, heteroaryl, or NR_fR_g ; wherein R_f and R_g are each independently hydrogen, (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkoxycarbonyl, aryl, or heteroaryl; and wherein any aryl or heteroaryl is optionally substituted with one or more (1, 2, 3, or 4) halo, mercapto, hydroxy, oxo, carboxy, cyano, nitro, trifluoromethyl, trifluoromethoxy, (C_1-C_{20}) alkanoyl, (C_1-C_{20}) alkanoyloxy, sulfo or (C_1-C_{20}) alkoxycarbonyl; or a salt thereof.

73. (NEW) The kit of any one of claims 22, 23, 24, and 49 wherein the organic compound is a compound of formula R_5-X-R_6 wherein:

X is -S- or -Se-;

R_5 is (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl; and R_6 is hydrogen, (C_1-C_{20}) alkyl, (C_3-C_8) cycloalkyl, (C_2-C_{20}) alkenyl, (C_2-C_{20}) alkynyl, aryl, or heteroaryl;

or R_5 and R_6 together with X form a heteroaryl;